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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/756,319

01/14/2004

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EXAMINER

ROE, JESSEE RANDALL

ART UNIT

PAPER NUMBER

1742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/756,319

Applicant(s)

OGAWA ET AL.

Examiner

Jessee Roe

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 10-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 16-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 14 January 2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-9 and 16-18, drawn to a hydrogen storage material, are currently under examination. Claims 10-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected hydrogen storage material production method, there being no allowable generic or linking claim.

The Applicant's election of claims 1-9 and 16-18 in the reply filed on 26 October 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP §818.03(a)).

Specification

The disclosure is objected to because of the following informalities: The vertical axis of the plots found in Figures 4 and 6 of the Drawings indicate units of g/mL, but volume % is indicated in the "Brief Description of the Drawings" section of the specification and at pg. 1, line 23 "activate" should be replaced by "activated".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Murakami et al. (US 4,749,514).

In regards to claim 1, Murakami et al. ('514) disclose a hydrogen storage material comprising a plurality of planar molecular layers stacked wherein a particle would be inserted between the planar molecular layers thereby inherently defining an interlayer distance between the planar molecular layers (col. 1, lines 45-68 and col. 2, lines 40-68).

In regards to claim 2, Murakami et al. ('514) disclose a hydrogen storage material wherein the particle would be an atom or molecule (col. 2, lines 40-68).

In regards to claim 4, Murakami et al. ('514) disclose a hydrogen storage material wherein the planar molecular layers would be formed of graphite (carbon) (col. 2, lines 1-35).

In regards to claim 5, Murakami et al. ('514) disclose a hydrogen storage material, however, Murakami et al. ('514) do not specify the interlayer distance. Murakami et al. ('514) disclose that the method for producing the hydrogen storage material is comprised of a vacuum or inert gas chamber (col. 2, lines 40-68). Because the materials used to make the hydrogen material and method used by Murakami et al. ('514) are the same as that of the instant invention, it would be inherent that interlayer

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distance between the planar molecular layers would be the same also. See MPEP 2112.01 I.

In regards to claims 6-9, Murakami et al. ('514) disclose a hydrogen storage material wherein the particles would include potassium, rubidium, cesium, copper, cobalt, nickel, iron, manganese, and aluminum chloride.

Claim 1-2, 4 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Baker et al. (US 6,484,858).

In regards to claim 1, Baker et al. ('858) disclose a hydrogen storage material, comprising a plurality of planar molecular layers stacked (col. 1, lines 16-37 and see Fig. 2A and Fig. 2B). The hydrogen storage material would have particles between the layers (col. 7, lines 25-35).

In regards to claims 2 and 8, Baker et al. ('858) disclose a hydrogen storage material wherein the particles inserted in the layers would be a molecule such as boron oxide or other metal particles (col. 6, line 66 – col. 7, line 10).

In regards to claim 4, Baker et al. ('858) disclose a hydrogen storage material wherein the particles would be primarily formed of graphite (carbon) (see abstract, Fig. 2A and Fig. 2B).

Claims 1-2, 8 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogino (US 6,294,276).

In regards to claims 1-2, 8 and 16-18, Ogino ('276) discloses a fuel cell vehicle comprising a hydrogen storage system which comprises a hydrogen storage tank that would comprise a hydrogen storage material (abstract, col. 8, line 40 - col. 9, line 20,

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Figures 1 & 4). Ogino also discloses that the storage material would comprise layers that would be stacked and between those layers platinum particles would be inserted and inherently define an interlayer distance between the layers (col. 17, lines 1-25 and Fig. 6).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (US 6,484,858).

In regards to claim 3, Baker et al. ('858) disclose a hydrogen storage material with particles inserted in the layers, but Baker et al. ('858) do not specify that the particle would be chemically bound to the planar molecular layer. However, Baker et al. ('858) do specify that the catalyst would be reacted in a heating zone to produce the desired nanofiber structural arrangement (col. 4, lines 46 – col. 5, line 8). Therefore, it would be obvious to one of ordinary skill in the art that the reaction would result in particles that would be chemically bound to the planar molecular layers after this process.

In regards to claim 5, Baker et al. ('858) disclose a hydrogen storage material wherein the interlayer spacing would be up to 1.025 nm. The interlayer spacing of Baker et al. ('858) overlaps with that of the instant invention thereby establishing a prima facie

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case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed interlayer spacing from that of Baker et al. ('858) because Baker et al. ('858) disclose the same utility (hydrogen storage material) throughout the disclosed range.

In regards to claim 6, Baker et al. ('858) disclose a hydrogen storage material wherein the graphite sheets would be etched with an alkali or alkaline earth metal in order to increase the surface area. Baker et al. ('858) do not specify that particle would be inserted in the molecular layers. However, the application of an etchant is a chemical reaction and it would be obvious to one of ordinary skill in the art that these particles would diffuse into the layers throughout this reaction.

Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (US 6,484,858) in view of Marchetti et al. (US 5,277,996).

In regards to claims 6-9, Baker et al. ('858) disclose a hydrogen storage as shown above, but Baker et al. ('858) do not specify that alkaline metal atoms such as potassium, rubidium, and cesium would be inserted into the planar molecular layers.

Marchetti et al. ('996), in the same field of endeavor, disclose doping potassium with a carbonaceous material (col. 2, lines 1-35). This doping would result in the maximization of electrical conductivity (col. 2, lines 1-35).

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to include potassium bonded to carbonaceous material, as disclosed by Marchetti et al. ('996), in the hydrogen storage material, as disclosed by Baker et al. ('858), in order to maximize electrical conductivity, as disclosed by Marchetti

et al. ('996) (col. 2, lines 1-35).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JR

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